HIGH-Q

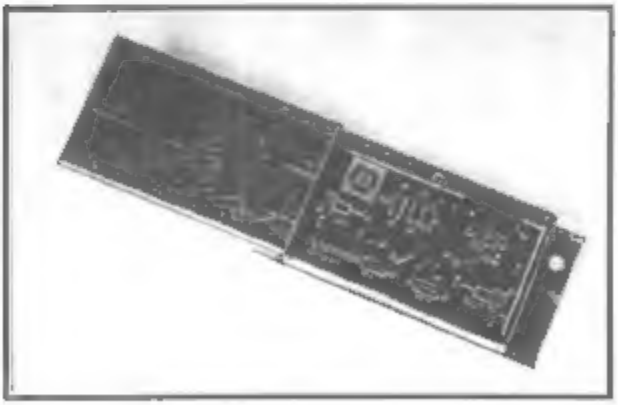
velleman-kit

Skill level : 1

AM - FM ANTENNA AMPLIFIER

K2622

- Supply voltage : 12 - 15 VDC not stabilized
- Direct power supply or via the coax cable
- Supply current : 1 - 3 mA
- Gain : ca. 22 dB (10MHz to 150MHz)
- Input impedance : 50 - 75 Ohm
- Output impedance : 50 - 75 Ohm
- Dimensions : 65 x 35 mm (2.56" x 1.38")



K 2622 AM-FM ANTENNA AMPLIFIER

INTRODUCTION

Although radios and tuners are getting more and more sensitive, there are still a lot of places where extra amplification of the signal is welcome: just think about the car radio, the hi-fi installation in the city where one often cannot install a good antenna. This kit is an inexpensive answer to this problem.
The construction is very simple and the metal housing makes the installation easy.
The power supply can either be derived from a car battery or a 12 VDC power supply (via the antenna cable or not).

TECHNICAL DATA

- Supply voltage : 12 - 15VDC unregulated
- Direct power supply or via the coax cable
- Supply current : 1 - 3mA
- Gain : approx. 22dB (10MHz to 150MHz)
- Input impedance : 50 - 75 Ohm
- Output impedance : 50 - 75 Ohm

AM - FM ANTENNA AMPLIFIER ASSEMBLY AND TOOLS

Check that you have all the parts

RECOMMENDED TOOLS

Miniature 50W soldering iron
Multicore solder
Soldering iron stand and sponge

ASSEMBLY

Attention :
This amplifier has to deal with high frequency signals. Keep the connections between components as short as possible, mount the resistors and condensers against the board and avoid using too much solder.

1. RESISTORS

Start assembly with the resistors .They are not polarized, so they can be inserted in either direction. Only the three primary color bands are mentioned. There may be a fourth band which can be ignored.

Inventory	Sequence of assembly	Reference	Part number / description
○	○	R1	22KΩ (red, red, orange)
○	○	R2	100KΩ (brown, black, yellow)
○	○	R3	18 Ohm resistor (brown, gray, black)

Inventory	Sequence of assembly	Reference	Part number / description
❍	❍	R4	1K2Ω (brown, red, red)
❍	❍	R5	220Ω (red, red, brown)

2. CAPACITORS

These capacitors are not polarized, so they can be inserted either way.

Inventory	Sequence of assembly	Reference	Part number / description
❍	❍	C1 and C2	470 pF capacitor (sometimes marked as 471)
❍	❍	C3	1 nF capacitor
❍	❍	C4	10 nF condenser

3. THE ELECTROLYTIC CAPACITORS

Note carefully the positive leads before you fit the capacitor into the PCB board.

Inventory	Sequence of assembly	Reference	Part number / description
❍	❍	C5	47 uF electrolytic capacitor. Watch the polarity!

4. TRANSISTORS

The transistor has a flat side and rounded side. The flat side faces the same direction as the flat side drawn on the PCB board.

Inventory	Sequence of assembly	Reference	Part number / description
○	○	T1	BF 199 transistor or equivalent.

5. PCB PINS

Inventory	Sequence of assembly	Part number / description
○	○	Mount the PCB pins.

CONSTRUCTION

Use a soldering-iron of a somewhat higher power for mounting the PCB in the case. 50 W will be perfect.

○ Put the PCB right in the middle of the case, over its mountings, component side up (see fig. 1.).

○ Solder the PCB to the housing at two locations. Check that the PCB is resting on the stands and that the components do not project above the case. Correct if necessary.

○ Now solder the PCB to the case all around. Do not do it all at once, but by stages, so that you do not overheat the components.

CONNECTION AND TEST

❍ Tune in your radio to a weak station and switch it off.

❍ Connect the input (cable to the antenna) and the output (cable to the tuner) at the points indicated on the PCB.

❍ The screen of the coax cable goes to the ground pin, the core respectively OUT and IN.

❍ Connect the whole to your tuner.
You should receive your station more clearly now. If you do not receive anything, then the power supply has to be bad or not switched on at all, or you must have made a mistake during the construction or the connection of the kit.

❍ If you want to supply the amplifier through the coax cable, mount the jumper (dotted line) and test the whole all over again but now with the antenna amplifier supply (can be bought in most electronics stores) inserted in the tuner lead.

❍ When everything functions normally, the bottom can be put on the housing. But check first whether it cannot lead to a short-circuit.

❍ Solder bottom and case together at four locations. The holes in the bottom can be used for attachment of the whole. When choosing the installation location ensure that the amplifier is put first: as close as possible to the antenna (in order to have the least possible loss before the amplifier, because something that is not there cannot be amplified) and second: is protected against the weather (the case is not sealed).

❍ Test the whole after the final installation, before connecting the lid at four places to the case.

APPLICATION IN TRANSMITTERS / RECEIVERS

The amplifier can also be used where an antenna is used both for transmitting and receiving.
Then the connections are switched by means of a relay that is operated by the transmit-receive button (see fig. 2) It should not be supplied by the coax cable (do not connect the jumper).
This configuration can only be used with low-power transmitter/receivers.
It is advisable to screen the relay circuit together with the antenna amplifier - and in this case alone - to put is as closely as possible to the transmitter / receiver.

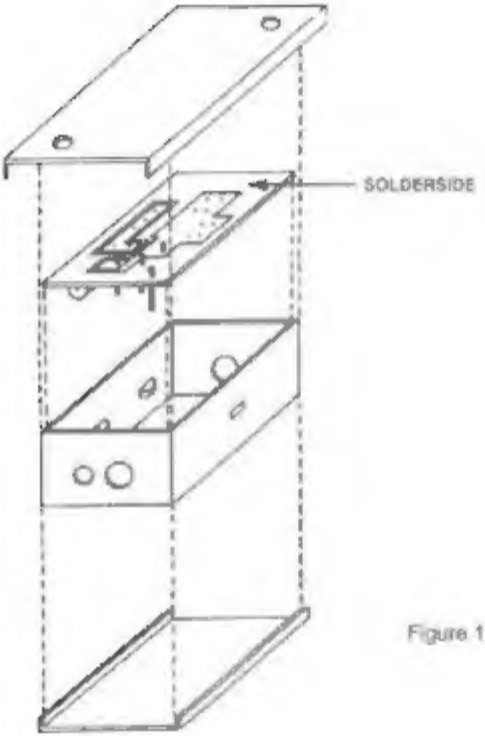


Figure 1

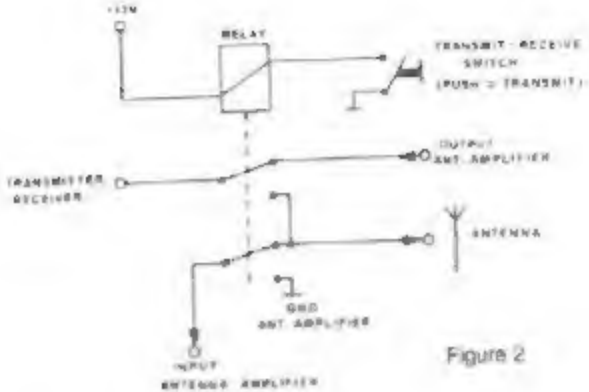
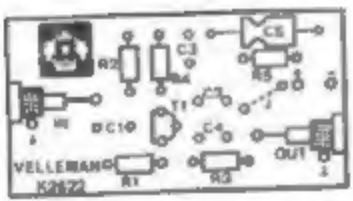
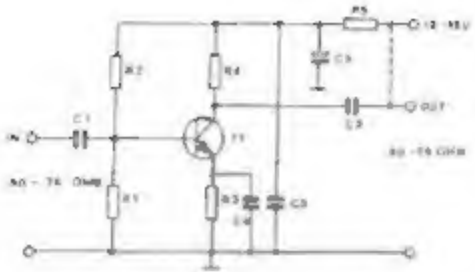


Figure 2



AM-FM Antenna Amplifier
PCB layout and
component layout



AM-FM Antenna Amplifier
Schematics